The first four peaks give the greatest integers requiring 548, 333, 314, 309 ninth powers, respectively. There is very strong evidence that a like result holds for the next 15 peaks. For example, all integers between $e+d$ and $e+2d$ are sums of 128 ninth powers; all between $e+2d$ and $e+3d$ are sums of 125.

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MAPS OF ABSTRACT TOPOLOGICAL SPACES IN BANACH SPACES*

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1. *Introduction.* This paper is to serve as a brief introduction to the method of considering the analysis of abstract topological spaces through the medium of homeomorphic mappings of these spaces on subsets of Banach spaces.† Our primary objective here, however, is to obtain for some general topological groups the abstract correspondents of the fundamental Lie partial differential equations for an r-parameter continuous group.‡ The essential notion is the treatment of the general situation with the aid of abstract *coordinates* in Banach spaces wherein the Fréchet differential may be used.§

By an abstract topological space is meant here a set of elements of completely unspecified nature, together with an undefined concept, that of neighborhood of an element (we denote the elements by small Latin letters, and the neighborhood associated with an element a by $U(a)$), satisfying the four Hausdorff postulates given below.||

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* Presented to the Society, November 30, 1935.

† S. Banach, *Théorie des Opérations Linéaires*, 1932.

‡ S. Lie, *Theorie der Transformationsgruppen*, vols. 1, 3.

§ M. Fréchet, *Annales de l'École Normale Supérieure*, (3), vol. 42 (1925), p. 293. Briefly, $f(x)$ on B_1 to B_2 has a differential at $x=x_0$, if there exists a function $f(x; z)$ on B_1^2 to B_2, linear (additive and continuous) in z and such that given a $\rho>0$ there is determined a $n>0$, so that $\|f(x_0+z)-f(x_0)-f(x_0; z)\| \leq \rho\|z\|$ for $\|z\| \leq n(\rho)$; $f(x_0; z)$ is the differential. See also various papers by Hildebrandt, Graves, Kerner, Michal, and many others.

|| F. Hausdorff, *Mengenlehre*, 1927, pp. 226–229.